REMARKS/ARGUMENTS

The Examiner's review of the application is much appreciated. The Examiner's comments regarding the assignment documents are noted, and efforts are underway to obtain signatures on corrected documents so as to perfect the priority claim in the present application.

Correction of the Record and Possible Amendment to the Specification

On close review of the application and claims, several unfortunate typographical errors were noted in Table 1 of the present application, extending back to the filing of the first case to which priority is claimed. A corrected version of Table 1 is reproduced below, with markings in red to show changes made. This table is presented to correct the record of the experimental results represented therein, and to comply with the duty of disclosure. The further possibility of amending the specification is discussed below.

Table I

	Comp. 1 (% weight)	Comp. 2 (% weight)	Comp. 3 (% weight)	previous boro-silicate (% weight)	Comp. A (% weight)	Comp. B (% weight)
SiO_2	65	71	71	81	70 ~~20~~	74.7
B_2O_3	15	15	15	13	15	13
Al_2O_3	11	10.7	9.7	2	3	9
Li_2O	2	3.3	3.3	-	1	3.3
Na_2O ~~OK_2O~~	-	-	-	4	-	-
K_2O	2	-	-	-	6	-
Ba_2O ~~B_2O~~	5	-	-	-	5	-
ZrO_2	-	-	1	-	-	-
Bulk Glass CTE (10^{-7}/°C)	39.1	34.6	33.8	32.5	40.1	35.6
Sintered Glass CTE (10^{-7}/°C)	39.7	35	35.2	79.2	121 ~~12.1~~	80.6
Softening Point (°C)	790	808	795	823	-	777
DIN 12116 (mg/dm^2)	42	1.7	2.8	<0.1 ~~20.1~~	-	0.4
ISO 695 (mg/dm^2)	-	226	153	102	-	113
Crystalline Phases	Amorphous	Amorphous/ Quartz	Amorphous/ Quartz	Cristobalite	Cristobalite	Cristobalite/ Quartz

At least some, and perhaps all, of the above corrections may be appropriate to make in the present application. Beginning in the left-most column of the table, it seems that it would be clear to one of ordinary skill in the art that sodium oxide (Na_2O) is missing from the alkali oxides listed, while potassium oxide (K_2O) erroneously appears twice. From the composition of the "previous borosilicate," called out as Pyrex® in the priority document (published as EPO application EP 1426345), one of ordinary skill would also likely recognize that sodium belongs on the line which corresponds to 4% weight content in the "previous borosilicate." It would most likely also be clear to one of ordinary skill that a second row showing boron (B_2O_3) in the first column should actually be barium (BaO) instead. Further, the performance of Pyrex® under the standard test of DIN 12116 has been published as < 0.1 rather than 20.1 as shown in the table in the fifth column, and it is believed this would be recognized as a typographical error by one of ordinary skill.

Whether the two errors in the column for Composition A ("Comp. A") are appropriately correctable is perhaps less clear, but it would at least be clear to one of ordinary skill that something is missing from the percentage totals in that column (the sixth from the left). The percentages in every one of the other five composition columns in the table add to exactly 100%. Adding the column for "Comp. A" shows that 50% is missing. That the missing amount belongs in the top row would most likely be clear, on reflection, to one of ordinary skill. That the sintered-glass CTE should generally the same as or higher than the bulk-glass CTE would also generally be known to one of ordinary skill. A misplaced decimal resulted in the erroneously low value in the table.

The undersigned proposes to amend the specification to correct the above typographical errors in Table 1, to the extent the Examiner finds the proposed corrections appropriate.

Claims Overview

Claims 1-5 have been cancelled and claim 6 has been amended herein. Claims 7-24 have been withdrawn as a result of an earlier restriction requirement. (In view of the Examiner's earlier restriction requirement, applicant retains the right to present claims 7-24 in a divisional application.) New claims 25-33 have been added for consideration.

Claim 6

Claim 6 recites, in part, a borosilicate glass having a CTE of from about 30 x 10^{-7}/°C to 45 x 10^{-7}/°C and comprising the following:

68% to 73% SiO_2;
13% to 17% B_2O_3;
8% to 15% Al_2O_3; and
2% to 5% Li_2O.

Claim 6 also recites that the borosilicate glass of the claim "resists devitrification upon sintering without the addition of an inhibitor oxide."

Examples in the Art of Record

None of the references of record disclose examples having these features.

Specifically, in Kosokabe (US Patent 5,747,399), glass compositions intended for fluorescent lamps with tungsten lead wires (Example 1, Tables 1-3) all have Al_2O_3 and Li_2O content below that of claim 6, as well as SiO_2 content above. On the other hand, the glass compositions intended for Kovar® lead wires (Example 2, Tables 4-7) all have either too little SiO_2, or too little Li_2O, or both, and too large a CTE. In Kunert (US Patent 6,204,212) the range listing in the table in column 2 lacks sufficient B_2O_3. In Clifford (US Patent 5,304,516), only one of 88 examples (example 82) has sufficient SiO_2, but that example lacks sufficient B_2O_3 by a large margin.

Ranges in the Art of Record

Kosokabe

Further, it is believed that none of the references of record disclose compositional or property ranges that are sufficiently specific to anticipate the features recited in claim 6, particularly in view of the unexpected or unknown results as shown in Table I of the present application.

In Kosokabe, for example, broad compositional ranges are given that encompass two different glass types, one for use in fluorescent bulbs with tungsten leads, and one for use in fluorescent bulbs with Invar® leads. The two glasses overlap only very little or not at all in some of the constituent ranges and in some properties, yet Kosokabe includes both into one broad range, and stretches the two ranges such that they meet in the middle. This broad overall range, found in the abstract, for example, and at column 2, lines 23-27, encompasses the recited ranges in claim 6 of the present application, as well as many other glasses. Comparison in the table below shows that the claim 6 ranges are narrow by comparison:

Constituent	Kosokabe Really Large Range	Claim 6
SiO_2	55-79	68-73
B_2O_3	12.5-25	13-17
Al_2O_3	0.5-10	8-15
Li_2O	0-16	2-5
CTE	34-55	30-45

Because of the large relative size of the Kosokabe large range, and because Kosokabe discloses and would be read by one of skill in the art to disclose two different glasses each with its own properties and compositional ranges, the large range is

believed to be insufficiently specific for anticipation. Further, the test results captured in Table I show that the relatively narrow ranges of claim 6 are significant in obtaining the desired and previously unknown or unexpected performance in the present invention. In particular, crossing the upper limit on SiO_2 results in significant devitrification of the resulting frit in typical firing cycles, as evidenced by the CTE increase—compare compositions 2 and 3 in the table with the comparison example composition B. Crossing the lower limit on Al_2O_3 likewise results in dramatic CTE increase in the sintered glass—compare compositions 1 and 2 with composition A. And crossing the lower limit on SiO_2 significantly reduces acid resistance—compare compositions 2 and 3 to composition 1. Kosokabe says nothing about these effects.

For the Kosokabe ranges for glass intended for use with tungsten, claim 6 shares only an endpoint of the SiO_2 range, and in the preferred range, as disclosed in Kosokabe, Al_2O_3 does not overlap at all. Kosokabe does not teach the desirability of keeping Al_2O_3 high (and SiO_2 sufficiently low) to avoid frit devitrification.

Constituent	Kosokabe Tungsten Large Range	Kosokabe Tungsten Preferred Range	Claim 6
SiO_2	73-79	73-78	68-73
B_2O_3	12.5-25	14-22	13-17
Al_2O_3	0.5-10	1-2.2	8-15
Li_2O	0-11	0-4, 0-2	2-5
CTE	34-43	--	30-45

For the Kosokabe ranges for glass intended for use with Kovar®, the CTE range overlaps that of claim 6 only slightly, and in the preferred ranges, the Al_2O_3 range does not touch or overlap that of claim 6, as Kosokabe does not teach the use of relatively high Al_2O_3 content.

Constituent	Kosokabe Kovar® Large Range	Kosokabe Kovar® Preferred Range	Claim 6
SiO_2	55-73	61-72	68-73
B_2O_3	15.2-25	16-24	13-17
Al_2O_3	1-10	1-4.9	8-15
Li_2O	0-16	0-4, 0-3	2-5
CTE	43-55	--	30-45

Particularly given the preferred ranges in Kosokabe—ranges that exclude the Al_2O_3 range values of claim 6—it is not likely that anyone following Kosokabe would even operate in the fringes of the large ranges provided in the specification. Indeed, as noted above, there are no examples in Kosokabe (from among 33 total examples) that fall within claim 6. Taken as a whole, Kosokabe does not disclose the features of claim 6 with sufficient specificity to warrant rejection, and claim 6 is believed to be allowable over Kosokabe.

Kunert

It is believed that there are no ranges disclosed in Kunert that overlap or touch all of the ranges recited in claim 6. Specifically for example, as mentioned above, the range listing in the table in column 2 lacks sufficient B_2O_3.

Clifford

In Clifford, broad compositional ranges are given for various possible constituents of a kiln-fired glaze. Comparison in the table below shows that the claim 6 ranges are narrow by comparison, and the CTE range does not overlap (ranges from chart in column 4 of Clifford):

Constituent	Clifford Really Large Range	Claim 6
SiO_2	45-75	68-73
B_2O_3	2-20	13-17
Al_2O_3	0.1-20	8-15
Li_2O	0.1-10	2-5
CTE	50-100	30-45

From this chart and from the fact, noted above, that no examples in Clifford (out of 88) fall within claim 6, claim 6 is believed to be allowable over Clifford.

Smith

The Smith reference (US Patent 5,747,395), although including some vary large ranges in its disclosure:

Constituent	Smith Really Large Ranges	Claim 6
SiO_2	30-70	68-73
B_2O_3	1-50	13-17
Al_2O_3	0-10	8-15
Li_2O	0-10	2-5
CTE	70-95 or 45-56	30-45

However, the Smith reference also teaches away from the present invention in that the Smith disclosure specifically teaches "a crystallizing glass composition" (for example at column 2, line 30) having the above constituent ranges, among others, while claim 6 of the present case recites that the composition claimed resists devitrification. Thus the Smith reference teaches directly away from one of the major features of the present invention, which fact serves to rebut any prima facie obviousness. Further, as with the

other references, the preferred ranges are also outside claim 6 (see the table in column 3 of Smith), and no examples (out of 24) fall within it.

New Claims

New claims 25-33 have been added for review. They are believed to be supported by the specification and claims as originally filed. They are believed to be allowable for the same reasons as those discussed above for claim 6, as they all depend directly or indirectly from claim 6.

Conclusion

Based upon the above amendments, remarks, and papers of record, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes that a three month extension of time is necessary to make this Reply timely, and a request for such is enclosed herewith. Applicant believes that no additional claim fees are required. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Greg Bean 607-974-2698

Respectfully submitted,

DATE: 2 Oct '06

Gregory V. Bean
Attorney for Assignee
Registration Number: 36448
Corning Incorporated
SP-TI-03-1
Corning, NY 14831
Phone: 607-974-